[illegible], Abba [illegible]ovich (L'vov State Univ) [illegible] degree of Doc Physico-Mathematical Sci for a [illegible] defense of dissertation: "Certain Questions of the Kinetic Theory of Systems of Interacting Particles" at the Council, Physico-Tech Inst, AS, USSR; Prot No 6, 1 [illegible] 54.

([illegible], [illegible])

GLAUBERMAN, A. Ye.

[illegible]
"Theory of Systems with Non-Centralized [illegible]"

Glauberman, A. Ye., and I.M. [illegible] (L'[illegible], [illegible]
(State University) [illegible]
Crystals

(The Physics of Dielectrics; Transactions of the All-Union Conference on the Physics of Dielectrics) Moscow, Izd-vo AN SSSR, 1958. 245 p. [illegible] copies printed

This volume publishes reports presented at the All-Union Conference on the Physics of Dielectrics, held in Dnepropetrovsk in August 1956, organized by the "Physics of Dielectrics" Laboratory of the Fizicheskiy institut imeni Lebedeva AN SSSR (Physics Institute imeni Lebedev of the AN SSSR) and the [illegible] Department of the Dnepropetrovskiy gosudarstvennyy universitet (Dnepropetrovsk State University).

GLAUBERMAN, A.Ye.; MUZYCHUK, O.M.

Resistance of semiconductors in strong magnetic fields [in Ukrainian with summary in English]. Ukr. fiz. zhur. 3 no.2:178-184 Mr-Ap '58. (MIRA 11:6)

(Semiconductors--Magnetic properties)

AUTHOR: [illegible]

TITLE: [illegible] of Systems with a Non-Central Law of the Interaction of Particles ([illegible]) [illegible]

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya [illegible] (USSR) 195[illegible], Vol [illegible], Nr [illegible]

ABSTRACT: A rigorous statistic [illegible] theory of [illegible] interacting particles has been successfully developed recently on the basis of the methods by N. N. [illegible] (Ref 1) The present report deals with the general system theory of interacting particles with [illegible] also orientational interaction is essential [illegible] central interaction. The author investigates gas or liquids in which interaction between the particles is characterized by a common potential. This potential depends on the distance between the gravity-centers of two [illegible] oriented particles, on the orientation of the lines of the center in the space and on the orientation of the "axes" of these particles. For the sake of simplicity the author assumes all parti-

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Theory of Systems with a Non-Central Law of
the Interaction of Particles

[illegible] 6/3[illegible]

[illegible] to be homogeneous. He investigates the systems, the density of which is of such a nature that the required functions F_s can be divided into series according to the degree of density, [illegible] according to r_0^3/v. When solving the equation of the function of distribution F_s: [illegible] obtained.

$$F_s^0 = C_s \exp(-U_s/\theta)$$

Higher approximations can be attained without great difficulties, but the calculations are in that case very voluminous. In the case of dipole gas, φ = PE cos ϑ must be put in the external homogeneous electric field. The formula by Shtokmayer, or the more simple formula by Keez, may be applied as such a potential. Without going into the details of the quantitative development of the theory, the author states that the proposed general theory easily comprises the systems consisting of axially symme-

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tric molecules with a constant quadrupole moment, or of axially symmetric molecules without moment and slightly marked orientational interaction. A comparison with the test for the gases C_2H_6 and CO_2 at $\bar{\gamma} = 0$ shows that with corresponding selection of the value $\lambda^2 \bar{\gamma}^2$ = const. satisfactory approximations can be achieved with respect to the experimentally obtained data. The second system investigated on the basis of the method developed by Bogolyubov was the dipole-crystal. The system in which the gravity centers of the dipoles are firmly fastened in the nodes of the lattice, was assumed to be a system of heterogeneous particles. The type of the particle is determined by the vector of the lattice nod in which its center of gravity is located. The calculation of the structural coefficients σ_i for different structures makes numerical calculation possible. With $\beta < 0,3$ the linear approximation of the function $L(\beta)$ can be applied. The simple formula:

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Theory of Systems With a Non-Central Law of the Interaction of Particles

$$P = \frac{np^2}{3kT}\left(1 - \frac{\gamma^{\sigma}{}_1}{3}\right)E$$

in which case E is the external field - is obtained for the polarization P in selected approximation. If it is assumed that $E = (\varepsilon + 2/3)\bar{E}$, in which case $\bar{E}$ is the mean macroscopic field in the dielectric

$$\frac{\varepsilon - 1}{\varepsilon + 2} = \frac{4\pi}{3} \cdot \frac{np^2}{3kT}\left(1 - \frac{\gamma^{\sigma}{}_1}{3}\right) + \dots$$

is obtained for the dielectric constant which is only correlated with the orientational effect. The method investigated makes it possible in principle to take account of the interaction of any character. The theory may be extended to dipole-liquids. There are 4 references, 2 of which are Soviet.

ASSOCIATION: L'vovskiy gos. universitet im. Ivana Franko (L'vov State University imeni Ivan Franko)

AVAILABLE: Library of Congress

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1. Particles--Theory 2. Dielectrics--Properties

48-22-3-7/30

AUTHORS: Glauberman, A. Ye., Spitkovskiy, I. M.

TITLE: On the Polarization of Ionic Displacement in Complex Ionic Crystals (O polyarizatsii ionnogo smeshcheniya v slozhnykh ionnykh kristallakh)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1958 Vol. 22, Nr 3, pp. 260-262 (USSR)

ABSTRACT: The formula for the polarizability of the displacements of ions of different kind as well as the presence of numerical estimations of these values must be known (Refs 1 and 2) for the establishment of a molecular theory of the dielectric properties of the ionic crystals, especially of the crystals of barium-titanate. In the case of the symmetric binary systems of the type of NaCl-crystal, the calculation is simple. With complex crystals it becomes difficult. The authors gave a simple general calculation scheme of polarizabilities of ionic displacement for crystals of random structure with a random number of ion-types in the present report. The charges e_k are displaced to ξ_k under the influence of the external field. The full potential energy of the system of charge which refer to the unit cell, is equal to:

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$$\sum_{l=1}^{n}\left[\frac{1}{2}U_l - e_l\mathcal{E}(r^o_{lx}+\xi_l)\right]$$ A system of equations with the solution of which the formula $d_k = \frac{ek\mathcal{E}}{E_k D}\sum_{l=1}^{n} e_l A_l^k$ for the polarizability is obtained, results from the calculation of the equilibrium conditions of the lattice in the presence of an external field with the assumed terms $(\partial^2 U_l/\partial\xi_i\partial\xi_j)_o = U^l_{ij}$. The formula found for α_k may be applied when solving the equation systems for effective fields which were given for the first time by G. I. Skanavi (Ref 1), as well as for the equation systems which occur in the theory of barium-titanate developed by Glauberman snf Lubchenko. The formula $\alpha_k = \frac{e_k}{E_k D^*}\sum_{l=1}^{n} e_l E_l A_l^{*k} + \frac{e_k B_k^*}{E_k D^*}$ for α_k is obtained from a somewhat different calculation scheme where only operations with effective fields acting on ions of different types are carried out. In the equations for effective fields of the type of those investigated in (Refs 1 and 2) the polarizabilities α_k are multiplied with the corresponding

On the Polarization of Ionic Displacement in Complex Ionic Crystals

effective fields. The second term of the right part of (6) can consequently by easily numerically estimated. The first term

$$\alpha'_k = \frac{e_k}{E_k D} \sum_{l=1}^{n} e_l E_l A_l^{*k}$$

can be numerically estimated only in the case of substitution of all effective fields by a certain effective mean field. The formulae (4) and (6) may be of use in the molecular quantity-theory of dielectric properties of ionic crystals. There are 3 references, 2 of which are Soviet.

ASSOCIATION: L'vovskiy gos. universitet im. Ivana Franko (L'vov State University imeni Ivan Franko)

AVAILABLE: Library of Congress

1. Crystals--Polarization 2. Crystals--Dielectric properties

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5(4)

SOV/76-32-11-21/32

AUTHORS: Glauberman, A. Ye., Pocharskiy, K. K.

TITLE: Thermodynamic Functions of Real Gases With an Orientation Interaction (Termodinamicheskiye funktsii real'nykh gazov s orientatsionnym vzaimodeystviyem)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol 32, Nr 11, pp 2594-2600 (USSR)

ABSTRACT: The method devised by N. N. Bogolyubov (Ref 1) (in the statistic physics of systems of interacting particles) on the functions, concerning the distribution of particle complexes, in principle comprises systems with different types of the law of intermolecular interaction. The general theory of real gases in the above-mentioned case leads to two results (equations (1) and (2)). If the function of the distribution of the molecules (in the corresponding approximation) is known, the mean and free energy of the system can be calculated and with it all quantities characterizing the state of equilibrium of this system. In the present case the secondary virial coefficients are calculated for a dipolar gas, as well as for a gas with non-spherical (symmetrical about an axis) molecules

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with weak orientation interaction, and the function of the coefficients versus the temperature were given in a graph (CO_2, C_2H_6 and $CHCl_2F$ - Figs 1-3). The constants of the central forces σ and ε were determined according to the method by A.D. Buckhingham (Bukingam) (Ref 4). As the virial coefficients may also be directly calculated (Ref 12) without using the method of the distribution function of complex particles, the mentioned curves are mainly only of methodic interest. There are 3 figures and 12 references, 3 of which are Soviet.

ASSOCIATION: L'vovskiy gosudarstvennyy universitet im. Ivana Franko (L'vov State University imeni Ivan Franko)

SUBMITTED: February 28, 1957

24(3) PHASE I BOOK EXPLOITATION SOV/2809

Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk

Termodinamika i stroyeniye rastvorov; trudy soveshchaniya... (Thermodynamics and Structure of Solutions; Transactions of the Conference Held January 27-30, 1958) Moscow, Izd-vo AN SSSR, 1959. 295 p. 3,000 copies printed.

Ed.: M. I. Shakhparonov, Doctor of Chemical Sciences; Ed. of Publishing House: N. G. Yegorov; Tech. Ed.: T. V. Polyakova.

PURPOSE: This book is intended for physicists, chemists, and chemical engineers.

COVERAGE: This collection of papers was originally presented at the Conference on Thermodynamics and Structure of Solutions sponsored by the Section of Chemical Sciences of the Academy of Sciences, USSR, and the Department of Chemistry of Moscow State University, and held in Moscow on January 27-30, 1958. Officers of the conference are listed in the Foreword. A list of other reports

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also read at the conference, but not included in this book, are given. Among the problems treated in this work are: electrolytic solutions, ultrasonic measurement, dielectric and thermodynamic properties of various mixtures, spectroscopic analysis, etc. References accompany individual articles.

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APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500010013-1"

FRENKEL', Yakov Il'ich; SEMENOV, N.N., akademik, glavnyy red.;
GLAUBERMAN, A.Ye., prof., zamestitel' glavnogo red.;
BARKOVSKIY, I.V., red.izd-va; SMIRNOVA, A.V., tekhn.red.

[Selected works] Sobranie izbrannykh trudov. Moskva, Izd-vo Akad.nauk SSSR. Vol.3. [Kinetic theory of liquids] Kineticheskaia teoriia zhidkostei. 1959. 458 p. (MIRA 13:1)
(Liquids, Kinetic theory of)

69135

24.2120

S/139/59/000/06/011/034
E032/E114

AUTHORS: Glauberman, A.Ye., and Porfir'yeva, L.A.

TITLE: On Higher Approximations in a New Form of "Plasma" Expansions

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1959, Nr 6, pp 76-34 (USSR)

ABSTRACT: Tyablikov and Tolmachev (Refs 7 and 8) have put forward a method for solving Bogolyubov's equations for a system of charged particles, using expansions in powers of the "plasma" parameter v/r_d where v is the volume per particle and r_d is the Debye radius. In this way they obtained the first approximation for the binary distribution function. The present paper is concerned with the derivation of higher approximations for the distribution functions of particle complexes and, in particular, for the binary function. The calculation is carried out for a multicomponent system of interacting charged particles, the system being neutral as a whole. There are 8 Soviet references.

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ASSOCIATION: L'vovskiy gosuniversitet imeni I. Franko (L'vov State University imeni I. Franko)

SUBMITTED: February 18, 1959

24 (0)

AUTHOR: Glauberman, A. Ye. SOV/53-68-1-17/17

TITLE: Vasiliy Stepanovich Miliyanchuk (Deceased)

PERIODICAL: Uspekhi fizicheskikh nauk, 1959, Vol 68, Nr 1, pp 197 - 198 (USSR)

ABSTRACT: On November 3, 1958, Professor V. S. Miliyanchuk, Doctor of Physical and Mathematical Sciences, Head of the Chair of Theoretical Physics at L'vovskiy gosudarstvennyy universitet im. I. Franko (L'vov State University imeni I. Franko) died in his 54th year of life. The author of this obituary gives a brief biography of the deceased. Miliyanchuk published his first scientific articles on theoretical problems of atomic spectra in the Periodical of Physics and in the Byuleten Pol'skoy Akademii nauk (Cracow). In 1933, he commenced his pedagogical career as an assistant of the Chair of Theoretical Physics at L'vov University (headed by Professor A. Rubinovich), where he returned as a Senior Assistant after completing further studies in Warsaw, Vilnyus, and Leipzig, in 1937. After the Unification of West Ukraine with the USSR he was appointed Professor of Theoretical Mechanics, and since 1946 he held the Chair of Theoretical Physics of L'vov University. He devoted himself to the investi-

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Vasiliy Stepanovich Miliyanchuk (Deceased) SOV/53-68-1-17/17

gation of atomic spectra, the forbidden lines, and the influence exerted by inhomogeneous fields upon the nature of the lines. In 1957, Miliyanchuk defended his dissertation for the degree of Doctor of Physical and Mathematical Sciences at the Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta (Department of Physics of Moscow State University) and was appointed Professor of the Chair of Theoretical Physics. He further worked in the field of quantum electrodynamics and general quantum field theory, the theory of solids, the theory of atomic collisions, etc. Finally, mention is made of his pedagogical and editorial work (edition of Fizicheskiy sbornik L'vovskogo universiteta, Trudy X Vsesoyuznoy konferentsii po spektroskopii in two volumes). There is 1 figure.

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24(2) SOV/20-126-3-23/69

AUTHORS: Glauberman, A. Ye., Vladimirov, V. V., Stasyuk, I. V.

TITLE: A New Form of the Polar Model of a Crystal (Novaya forma polyarnoy modeli kristalla)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 3, pp 543 - 545 (USSR)

ABSTRACT: In the first part of the present paper the so-called polar model, which is of great importance in the many-electron theory of solids in connection with transport processes, is dealt with. If the polar states are taken into account, it is possible to represent the Hamiltonian of a crystal in form of the equation (1) (in second quantization), in which the complex index denotes the number of lattice points, the state of the valence electron, and the spin. The formulation of the problems of elementary excitation (quasicorpuscular) is considered to be of basic and practical importance, and so is the theoretical investigation of the polar model by the method introduced by S. Shubin and S. Vonsovskiy. Here, the bilinear groups of Fermi amplitudes are replaced by the sum of a group of new Bose operators. In the second part of this paper the new form of the theory is discussed, and it is initially pointed out that it contains no major errors. By a canonical transformation

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of the Fermi operators the excitation operators of the dyads and holes are obtained. For purposes of illustration, the problem of the atomic semiconductors is then investigated according to the new method, and a comparison is drawn with that developed by Shubin and Vonsovskiy. The scheme introduced makes it possible to investigate the saturated spin background and the displaced background, as well as to calculate the excitons. There are 6 references, 5 of which are Soviet.

ASSOCIATION: L'vovskiy gosudarstvennyy universitet im. Ivana Franko (L'vov State University imeni Ivan Franko)

PRESENTED: February 16, 1959, by N. N. Bogolyubov, Academician

SUBMITTED: January 12, 1959

S/181/60/002/01/27/035
B008/B014

AUTHORS: Glauberman, A. Ye., Vladimirov, V. V., Stasyuk, I. V.

TITLE: Theory of Elementary Excitation in Atomic Crystals

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 1, pp. 133-143

TEXT: In theoretical studies on the multielectron theory of solids the polar model is often based on the method developed by S. I. Shubin and S. V. Vonsovskiy. As the usual scheme of this method causes many difficulties, the authors of the article under review devised a new general scheme for the "re-denotation" of operators. This scheme permits a logical development of the theory of elementary excitation in semiconductors if one s-state and the p-states are taken into account. The statistics of true elementary excitations results unambiguously from the model. The separation of the background and "averaging" over the background are fully satisfied. An introductory rule is set up for exciton operators in this connection. The scheme described apparently offers special advantages in the case of the "open spin" degenerate background. Here, the problem of averaging over the background has not yet been solved √B

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Theory of Elementary Excitation in Atomic Crystals

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satisfactorily. The rules governing the elimination of true excitation from undefined operators (if they do not agree with one another) also result unambiguously from the model. These rules permit an accurate verification of the terms of "quadratic" approximation as well as the terms of higher orders of magnitude describing kinetic phenomena. Mention is made of Frenkel'. There are 7 Soviet references.

ASSOCIATION: L'vovskiy gosudarstvennyy universitet (L'vov State University)

SUBMITTED: February 26, 1959

VB

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GLAUBERMAN, A.Ye.; MUZYCHUK, A.M. [Muzychuk, O.M.]

Many-electron theory of liquid semiconductors. Ukr. fiz. zhur. 5 no. 5:597-605 S-O '60. (MIRA 14:4)

1. L'vovskiy gosudarstvennyy universitet.
(Semiconductors)

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S/048/60/024/01/08/009
B006/B014

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AUTHOR: Glauberman, A. Ye.

TITLE: A New Type of a Polaron Model of a Crystal

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 1, pp. 101-103

TEXT: The article under review was read at the Second All-Union Conference on the Physics of Dielectrics (Moscow, November 20-27, 1958). In the theory of weakly excited crystals in which the number of elementary excitations is small (in the so-called polaron model), a method permitting separation of the part of the Hamiltonian that contains elementary excitations, is of special value. Here, the author suggests the method devised by Shubin and Vonsovskiy, on the basis of theoretical studies of metals, semiconductors, and dielectrics. However, two difficulties are encountered in transforming the second quantization Hamiltonian: First, the operators of the quasi-particles are introduced as Bose-type operators, which is not permissible from a physical point of view. Secondly, the setup of the Hamiltonian in the new operators is complicated, so that

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A New Type of a Polaron Model of a Crystal

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it is necessary on the strength of qualitative considerations to express the bilinear groups of Fermi amplitudes by groups of state operators of the lattice points. To obtain the excitation operators it is necessary to go over to the quasi-classical approximation for all other operators. In view of these considerations the author derived an expression for an excitation Hamiltonian on the basis of linear transformations of the Fermi amplitudes. This expression reads $H_{exc} = eF\sum_q R_{qy}\left(\phi_q\phi_q^+ - \psi_q\psi_q^+\right) + \mu_B H \,\mathrm{th}\,\frac{\mu_B H}{kT}\left[N - \sum_q\left(\phi_q\phi_q^+ + \psi_q\psi_q^+\right)\right] + \frac{1}{2}(A + I)\sum_q\left(\phi_q\phi_q^+ + \psi_q\psi_q^+\right) + \sum_{q\neq q'} L_{qq'}\left(\phi_q\phi_{q'}^+ - \psi_q\psi_{q'}^+\right)$. The only deviation from the final result, which occurs in this approximation, is that the operators of the dyads and holes appear as Fermi-type operators. The scheme suggested here has a universal character and may be extended for the case of a germanium-type or impurity crystal. V. Vladimirov and I. Stasyuk are mentioned in this article. There is 1 Soviet reference.

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S/053/60/071/01/03/011
B006/B011

AUTHORS: Glauberman, A. Ye., Stasyuk, I. V.

TITLE: Third Conference on the Theory of Semiconductors

PERIODICAL: Uspekhi fizicheskikh nauk, 1960, Vol. 71, No. 1, pp. 117-130

TEXT: This Conference was held at L'vov from April 2 to 9, 1959, and was organized by the Komissiya po poluprovodnikam AN SSSR (Commission for Semiconductors of the AS USSR) and the Komissiya po poluprovodnikam AN USSR (Commission for Semiconductors of the AS UkrSSR) jointly with the L'vovskiy gosudarstvennyy universitet im. I. Franko (L'vov State University imeni I. Franko). The Conference was attended by 200 delegates from Moscow, Leningrad, Kiyev, Sverdlovsk, Khar'kov, L'vov, Minsk, Tbilisi, Tartu, and other centers. In total 86 lectures were heard. The first address was delivered by F. T. Koval', Secretary of the L'vov oblast' Committee of the Ukrainian CP, followed by Professor A. I. Yurzhenko, deputy rector, who spoke on behalf of the rector of L'vov State University. The Conference was opened by Professor S. I. Pekar, who spoke on the development of the semiconductor theory in the USSR in the two and a half

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years elapsed since the previous conference. A great number of lectures was devoted to the many-electron theory of solids. Lecturers were S. V. Vonsovskiy, M. Sh. Giterman, G. I. Gusev, G. G. Taluts on the treatment of electronic excitations with the many-electron theory; V. I. Cherepanov and V. S. Galishev on the selection rules for optical exiton transitions in dipole and quadrupole approximation; Yu. A. Firsov took part in the discussion. Ye. N. Agafonova and I. A. Korunova spoke on the consideration of the influence exerted by Bose excitations on the thermal conductivity of atomic semiconductors. In his lecture concerning the theory of elementary excitations in semiconductors, A. Ye. Glauberman suggested a new form of a polaron model of the crystal. This new method is outlined in its main features. V. L. Bonch-Bruyevich dealt with some problems of the theory of electron - hole plasma in semiconductors. M. Ya. Azbel' took part in the discussion. Further lectures were devoted to the theory of exiton excitation in crystals. Lecturers were S. I. Pekar on the theory of electromagnetic waves in a crystal in the zone of exiton absorption, I. M. Dykman and S. I. Pekar on light waves in crystals in the zone of exiton absorption and the impurity photoeffect; Yu. M. Popov and V. M. Agranovich took part in the discussion; V. A. Moskalenko on

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exiton energy in ion crystals, E. M. Rashba on the effect of resonance excitation transfer in the theory of exitons with large radius; A. G. Samoylovich and A. A. Lipnik on bond and decay of Mott exiton, S. I. Pekar and M. I. Kaganov took part in the discussion. A. V. Tulub spoke on the free path length of the exiton in polar crystals. Further lectures were devoted to the optical properties in semiconductors. Lecturers were L. E. Gurevich and Z. I. Uritskiy on the theory of infrared absorption of crystals (Ye. F. Gross, B. P. Zakharchenya, and Pavinskiy are quoted); A. V. Sokolov and V. P. Shirokovskiy on the theory of optical properties in semiconductors; O. V. Konstantinov and V. I. Perel' on the effect of spatial dispersion in the passage of waves through a semimetal in a strong magnetic field (M. Ya. Azbel' and M. I. Kaganov took part in the discussion); A. G. Samoylovich, M. I. Klinger, and L. L. Kornblit on the statistical theory of linear irreversible processes; Yu. P. Irkhin and Ye. A. Turov on the phenomenological theory of electrical conductivity of ferromagnetic semiconductors. A. I. Ansel'm and I. G. Lang delivered a lecture on the theory of two-phonon scattering of conduction electrons in atomic crystals, M. A. Krivoglaz on the theory of phonon thermal conduction of crystals, A. I. Ansel'm and V. M. Agranovich took part in the

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discussion. Further lectures were delivered by Yu. M. Popov and V. A. Chuyenkov on the dependence of the mobility of electrons and holes in germanium and silicon on the electric field strength at low temperatures, M. I. Iglitsyn, Yu. A. Kontsevoy, and K. V. Temko on the calculation of the conduction recovery time of the basic region of the planar transition by taking into account the dependence of the carrier lifetime on the injection level; E. I. Adirovich and Ye. M. Kuznetsova on the capacity and the electric breakdown of p-n transitions; V. A. Chuyenkov on the theory of electric breakdown in semiconductors; L. V. Keldysh on the kinetic theory of impact ionization in semiconductors, G. V. Gordeyev on the current multiplication due to impact ionization on the p-n transition; A. Yu. Leyderman and P. M. Karageorgiy-Alkalayev on the application of the scheme of a semiconductor with one impurity level to explain the photoconductivity and photoactivity quenching effects. A further group of lectures was devoted to the study of the structure of the energy spectrum of the current carrier. Lecturers were A. I. Gubanov and A. A. Kran'yan on the investigation of the energy spectrum of semiconductors with sphalerite structure; K. D. Tovstyuk and I. V. Gvozdovskiy on the energy spectrum of current carriers in crystals having the structure of zinc

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blende; V. A. Chaldyshev on the structure of the energy spectrum of crystals with chalcopyrite lattice (Smolukhovskiy is mentioned); Ye. I. Cheglokov on the application of the method of equivalent orbits for the calculation of the valence bands of some covalent crystals; G. Ye. Pikus and G. L. Bir on the influence exerted by deformation on the energy spectra and energetic properties of p-type germanium and silicon; A. I. Ansel'm took part in the discussion. The following lectures were devoted to the theory of impurity centers, their luminescence, and to the calculation of the recombination of the various centers in the crystal. Lecturers were I. A. Mirtskhulav on the determination of the recombination coefficients of different centers in the crystal (S. I. Pekar is mentioned); A. I. Gubanov, S. I. Pekar, and V. L. Bonch-Bruyevich took part in the discussion; A. M. Ratner and G. Ye. Zil'berman on the theory of luminescence of impurity centers; I. N. Kristofel' on the quantum-mechanical calculation of adiabatic potentials and spectra of luminescence center in KCl-Tl; Yu. E. Perlin on the consideration of the polaron effect in the theory of the many-photon ionization of impurity centers; K. K. Rebane on the relationship between recombination luminosity and conductivity in crystal phosphors; V. M. Buymistrov and V. N. Piskovyy on an investigation of the

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accuracy of the variation method in the problem of the impurity absorption in silicon crystals; M. M. Zaripov, V. M. Vinokurov, and V. G. Stepanov on the paramagnetic resonance in rutile single crystals; A. G. Samoylovich and S. L. Korolyuk on the theory of elementary excitations in atomic semiconductors with two valency electrons on each atom; S. V. Vonsovskiy and M. Sh. Giterman on the treatment of ion crystals with the many-electron theory; I. V. Stasyuk on the calculation of the magnetic resistance of semiconductors; V. V. Vladimirov on the calculation of the contribution given by Frenkel' exitons in the magnetic conductivity of semiconductors; A. Ye. Glauberman and I. T. Tsymburskaya on the consideration of the character of the chemical bond in the theory of the magnetic resistivity of germanium-type semiconductors; K. B. Tolpygo on the theoretical investigation of the properties of not fully polar crystals. The structure of the carrier energy spectrum was dealt with in the following lectures: A. I. Gubanov and F. M. Gashimzade (Investigation of the structure of semiconductors of the type of $CdIn_2Se_4$ with the method of the group theory); K. Ya. Shtivel'man (investigation of p-type energy spectrum in crystals with diamond structure by means of the many-electron theory); O. V. Kovalev and T. Ya. Lyubarskiy (contact of energy bands in

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crystals); Ye. K. Kudinov (computation of p-type energy spectrum in Bi_2Te_3 under consideration of the bond character); E. I. Rashba and V. I. Sheka (investigation of the band structure of semiconductors with the group theory); V. I. Cherepanov (optical properties of semiconductors in the infrared); S. A. Moskalenko (exiton absorption of light in cuprous oxide at the long-wave edge of self-absorption); A. A. Vorob'yev (relationship between additional absorption and chemical composition in alkali halide crystals); I. V. Abarenkov (investigation of the properties of F-centers); L. E. Gurevich and I. P. Ipatova (Faraday effect in semiconductors on the free carriers); I. D. Potekhina (relaxation processes in a phototriode); V. Ye. Khartsiyev (kinetics of photo- and thermostimulation processes); Ye. N. Agafonova and A. A. Yakub (influence of anisotropy of the energy spectrum of an atomic semiconductor on the thermoelectromotive force); G. A. Zholkevich (experimental investigation of the change in photoelectric properties of zinc selenide layers in dependence on their structure); M. I. Kaganov and V. M. Tsukernik (influence of thermoelectric forces on the skin effect in metals); A. D. Chevychelov (volt-ampere characteristic of the p-n transition under consideration of the electron - hole recombination in the transition layer); A. G. Samoylovich and M. I. Klinger

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(investigation of anisotropic weak electron-phonon scattering in anisotropic energy spectra of electrons and holes by means of a general non-equilibrium distribution function); B. Ya. Yurkov (computation of the range-energy ratio for silicon-type crystals); Ye. P. Pokatilov (investigation of the carrier resonance under the action of ultrasonic waves); V. A. Kovarskiy (investigation of the dependence of thermal transitions of electrons in semiconductors on the electron-phonon coupling constant); I. G. Lang (two-phonon processes in the scattering of conduction electrons in ion crystals); L. E. Gurevich and G. A. Roman (calculation of the thermal conductivity of ferromagnetic semiconductors at low temperatures); B. Ya. Moyzhes (heat-transfer in monoaxial crystals due to electromagnetic radiation); Ye. D. Devyatkova and I. A. Smirnov are mentioned; N. P. Kontorovich and Yu. P. Irkhin (electrical conductivity of magnetite at low temperatures); A. G. Samoylovich and V. M. Nitsovich (influence of the correlation between electrons on the electric properties of a semiconductor with narrow impurity band); V. P. Shabanskiy (non-equilibrium processes in impurity semiconductors); V. G. Skotov (conductivity of semiconductors at low temperatures in the strong magnetic field); F. G. Bass and M. I. Kaganov (theory of galvanomagnetic phenomena on the basis of classical equations of motion if $\mu H \ll kT$); I. M. Tsidil'kovskiy and V. P. Shirokovskiy (galvano- and thermomagnetic phenomena in n- and p-type germanium under consideration of the carrier spectrum); S. M. Ryvkin, Yu. L. Ivanov, A. A. Grinberg, S. R. Novikov, and N. D. Potekhina (concentration distribution of the minority carrier in the magnetic field); V. L. Gurevich (absorption of ultrasonics in metals in the magnetic field), A. M. Kosevich and V. V. Andreyev (the collision integral in the quantum-kinetic equation); M. I. Kaganov (on the relaxation of the magnetic moment in ferromagnetic dielectrics); K. B. Vlasov and B. Kh. Ishmukhametov (rotation of polarization plane of elastic waves in magnetically polarized magnetoelastic media); Ye. A. Turov (theory of weak ferromagnetism). The following problems were discussed at the seminar on the theory of p-n transitions: (1) calculation of the statistical volt-ampere characteristic of the p-n transition at high injection levels (lecture by V. I. Stafeyev); (2) computation of the statistical volt-ampere characteristic of the p-n transition in the case of recombination in the zone of volume charge (lecture by V. I. Stafeyev and B. V. Tsarenkov); (3) influence of volume charge of moved carriers on the electric breakdown of a strong asymmetric p-n transition (lecture by A. I. Uvarov). The following

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delivered lectures at the seminar on the mechanism of luminescence and electrical conductivity in ion crystals: Ch. B. Lushchik (luminescence in alkali halide crystals); P. V. Meyklyar and V. V. Gladkovskiy (dark conductivity of silver bromide and its change after exposure to light); the following spoke at the seminar on Green functions in statistical physics: V. L. Bonch-Bruyevich and Sh. M. Kogan on the theory of Green temperature quantum functions, and N. N. Bogolyubov and S. V. Tyablikov on advanced and delayed Green functions in statistical physics. There are 13 references, 9 of which are Soviet

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E032/E514

26.2311

AUTHORS: Glauberman, A. Ye. and Porfir'yeva, L. A.

TITLE: On "Plasma" Expansions

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy,, Fizika, 1961, No.1, pp.147-149

TEXT: In a previous paper (Ref.1) the present authors discussed a general scheme for the determination of higher approximations in expansions in terms of the plasma parameter for functions describing the distribution of particle complexes in a system of interacting ions, which is neutral as a whole. The mutual potential $\Phi_{\alpha\beta}$ was assumed to be finite at the origin, e.g.

$$\Phi_{\alpha\beta} = \frac{e_\alpha e_\beta}{r}\left(1 - A_{\alpha\beta}(r)\, e^{-a_{\alpha\beta} r}\right). \qquad (1)$$

The present paper extends the discussion given in Ref.1 to the general case of a neutral non-symmetric system. In this general case the equation for $h^1_{\alpha\beta}$ is

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On "Plasma" Expansions

$$\frac{\partial}{\partial q_a^\alpha} h_{ae}^1 + \sum_c n_c \int \frac{\partial \Psi_{ac}}{\partial q_a^\alpha} \left\{ h_{ec}^1 + h_{aec}^0 + \frac{g_{ec}^{0\,2}}{2} + g_{ac}^0 g_{ec}^0 \right\} dq_c = 0. \tag{3}$$

and, correspondingly

$$\frac{\partial}{\partial q_a^\alpha} h_{aec}^0 + \sum_d n \int \frac{\partial \Psi_{ad}}{\partial q_a^\alpha} \left\{ h_{ecd}^0 + g_{ed}^0 \, g_{cd}^0 \right\} dq_d = 0, \tag{4}$$

$$h_{aec}^0 = \sum_d n_d \int g_{ad}^0 \, g_{ed}^0 \, g_{cd}^0 \, dq_d \tag{5}$$

so that

$$h_{ae}^1 = \sum_c n_c \int \left\{ g_{ac}^0 \frac{g_{ec}^{0\,2}}{2} + \frac{g_{ac}^{0\,2}}{2} g_{ec}^0 \right\} dq_c +$$

$$+ \sum_{c,d} n_c n_d \int \int g_{ad}^0 \, g_{ec}^0 \, \frac{g_{cd}^{0\,2}}{2} dq_c dq_d. \tag{6}$$

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Finally, the binary distribution function in the general case is given by

$$F_{ab} = \exp\left\{ v g^{0}_{ab} \right\}\left\{1 + v^2 h^1_{ab} + v^3 h^2_{ab} + \dots\right\}. \qquad (7)$$

where $h^1_{\alpha\beta}$ is defined by Eq.(6). In the case of a system consisting of particles of the same sign and located in the compensating field of the space charge consisting of particles of the opposite sign, which are uniformly distributed in space and whose potential is given by

$$\varphi = \int \frac{\rho dq_{s+1}}{|q_1 - q_{s+1}|}, \qquad \rho = \text{const}, \qquad (8)$$

(8)

the following results are obtained. The equations for the functions $C_{1\dots s}$, which are defined by

$$F_{1\dots s} = \exp\left\{-\bar{U}_{1\dots s}/\theta\right\} C_{1\dots s} \qquad (9)$$

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(Tyablikov and Tolmachev, Ref.2) will in the latter case be of the form

$$\frac{\partial C_{1\ldots s}}{\partial q_1^a} + \frac{1}{\Theta}\left(\frac{\partial U_{1\ldots s}}{\partial q_1^a} - \frac{\partial \overline{U}_{1\ldots s}}{\partial q_1^a}\right) C_{1\ldots s} + \frac{1}{\Theta v}\int \frac{\partial\Phi(|q_1 - q_{s+1}|)}{dq_1^a} \times$$
$$\times \left\{\exp\left[-\frac{1}{\Theta}\sum_{1\leq l\leq s}\Phi(|q_l - q_{s+1}|)\right]C_{1\ldots s+1} - C_{1\ldots s}\right\} dq_{s+1} = 0. \qquad (10)$$

Finally,

$$h_{123}^0 = \int g_{14}^0\, g_{24}^0\, g_{34}^0\, dq_4,$$
$$h_{12}^1 = \int\left\{g_{13}^0 \frac{g_{23}^{0^2}}{2} + \frac{g_{13}^{0^2}}{2} g_{23}^0\right\} dq_3 + \int\int g_{14}^0\, g_{23}^0\, \frac{g_{34}^{0^2}}{2}\, dq_3\, dq_4 \qquad (11)$$

and similarly for other approximations of the distribution functions.
There are 2 Soviet references.

ASSOCIATION: L'vovskiy gosuniversitet imeni Ivana Franko (L'vov State University imeni Ivan Franko)

SUBMITTED: February 18, 1960

Card 4/4

GLAUBERMAN, A.Ye.; STASYUK, I.V.

Theory of elementary excitations in systems with an open-spin background. Fiz.tver.tela 3 no.7:2081-2096 Jl '61. (MIRA 14:8)

1. L'vovskiy gosudarstvennyy universitet imeni Ivana Franko.
(Nuclear spin) (Crystals--Models)

30331
S/185/61/006/005/007/019
D274/D303

24.7700 (1043,1055,1144)

AUTHORS: Stasyuk, I.V., and Hlauberman, A.Yu.

TITLE: On the formation of impurity bands

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 6, no. 5, 1961, 642 - 654

TEXT: The formation of impurity bands is considered by means of the many-electron theory. The present study is related to Ref. 2 (A.Yu. Glauberman, V.V. Vladimirov, I.V. Stasyuk: FTT, 2, 133, 1960). A semiconductor model is considered which is representative of germanium or silicon with pentavalent impurities. It is assumed that the crystals have a cubic structure as well as impurity atoms; the atoms of the principal sublattice (denoted by σ) have two electrons each, and the impurity atoms (ρ - sublattice) - one electron each. The Hamiltonian of the electron system is

$$\hat{H} = \sum_{q\lambda f} E_\lambda a^+_{q\lambda f} a_{q\lambda f} + \sum_{qq'\lambda\lambda' f} L(q\lambda, q'\lambda') a^+_{q\lambda f} a_{q'\lambda' f} + \qquad (1.1)$$

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D274/D305

$$+\frac{1}{2}\sum_{\substack{qq'll' \\ \lambda\lambda'\nu\nu'f}} \Phi(q\lambda q'\lambda', l\nu l'\nu')\, a^{+}_{q\lambda f} a^{+}_{q'\lambda' f} a_{l'\nu' f} a_{l\nu f}; \qquad (1.1)$$

where q is the number of the lattice point, ν, λ denotes the electrontron state (s or p), f is the electron spin;

$$L(q\lambda, q'\lambda') = \int \varphi^{*}_{q\lambda}(\mathbf{r}) \sum_{p \neq q} V(\mathbf{r} - \mathbf{R}_p)\, \varphi_{q'\lambda'}(\mathbf{r})\, d\mathbf{r};$$

$$\Phi(q\lambda q'\lambda', l\nu l'\nu') = \iint \varphi^{*}_{q\lambda}(\mathbf{r})\, \varphi_{l\nu}(\mathbf{r}) \frac{e^2}{|\mathbf{r} - \mathbf{r}'|} \varphi^{*}_{q'\lambda'}(\mathbf{r}')\, \varphi_{l'\nu'}(\mathbf{r}')\, d\mathbf{r}\, d\mathbf{r}';$$

"Triplets" and "singlets" are considered in the σ-sublattice, and "doublets" and holes in the ρ-sublattice. The transition to the operators of the quasi-particles is effected by means of

$$a^{+}_{ps_{\frac{1}{2}}} = \frac{1}{\sqrt{2}}(\alpha^{+}_{p} + \beta_{p}),$$
$$a^{+}_{ps_{-\frac{1}{2}}} = \frac{1}{\sqrt{2}}(\alpha^{+}_{p} - \beta_{p}), \qquad (1.2)$$

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$$a^{+}_{ns_{\frac{1}{2}}} = \beta_{n_1} \qquad a^{+}_{np_{\frac{1}{2}}} = \alpha^{+}_{n_1}$$
$$a^{+}_{ns_{-\frac{1}{2}}} = \beta_{n_2} \qquad a^{+}_{np_{-\frac{1}{2}}} = \alpha^{+}_{n_2}. \tag{1.2}$$

If the terms which describe pair creation or annihilation are neglected, the dislocation Hamiltonian is written in the second approximation:

$$\hat{H}_p = \hat{H}_\alpha + \hat{H}_\beta \tag{1.3}$$

where $\hat{H}_\alpha$ and $\hat{H}_\beta$ are given by expressions. The terms of these expressions which contain K_1 and K_2 describe the migration of elementary dislocations from the principal sublattice to the impurity sublattice and conversely. These processes lead to the formation of impurity bands of considerable width. Further, the Hamiltonian $\hat{H}_\alpha$ is diagonalized. This involves a transition to k-space (quasi-momentum space). After transformations, one obtains:

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$$\hat{H}_a = \sum_{\kappa, m} E_m(\mathbf{k}) \xi^+_{m\kappa} \xi_{m\kappa} \qquad (m = 1, 2, 3). \tag{2.31}$$

The energies $E_1(k)$ and $E_2(k)$ are those of the elementary dislocations, described by the Fermi-operators ξ^+_{1k}, ξ_{1k}, and ξ^+_{2k}, ξ_{2k}. These elementary dislocations correspond to "triplets" in the principal sublattice (the conductance electrons of band theory). With low impurity-concentrations the width of the impurity band is given by

$$\Delta E' = 12P(d). \tag{2.34}$$

The dependence on concentration, of the integral P(d) which describes the interaction between impurity sites and principal sites, can be estimated by using quasi-hydrogenic wave-functions instead of atomic wave-functions. Thereupon one obtains

$$\Delta E' \simeq 12\, F(d)\, d^3\, e^{-\frac{d}{\alpha}}, \tag{2.35}$$

where F(d) increases with d (linearly); α is a parameter of the

On the formation of impurity bands S/185/61/006/005/007/019
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same order as the lattice constant. The constant d of the impurity lattice can be expressed by the concentration of impurity atoms, viz.

$$d^3 = \frac{V}{N_\rho} . \quad (2.36)$$

It follows from (2.35) that even in the approximation neglecting terms with $K_2(k)$, the decrease in band-width with decreasing impurity concentration is much slower than would follow from a direct interaction between impurity sites. Due to the exponential factor $e^{-d/\alpha}$, the width $\triangle E'$ is small, and with an impurity concentration of 10^{14} - 10^{15} cm^{-3}, it is close to zero. Taking into account the dislocation migrations between the σ- and ρ sublattices, leads to a considerable change in the energy spectrum of the impurity carriers. In this case, the dependence (on concentration) of $\triangle E'$, can be ascertained by investigating the dependence (on concentration) of K_2 (k). After transformations, one obtains

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$$\widetilde{K}_2(\mathrm{k}) = 8\sqrt{\frac{N_p}{N_s}}\left[K_2'(a') + Ge\eta\frac{N_p}{V}\right]\cos\frac{k_x a}{2}\cos\frac{k_y a}{2}\cos\frac{k_z a}{2}. \qquad (3.15)$$

The width of the "doublet" impurity band is given by

$$\widetilde{\Delta E}_3 = 8\sqrt{\frac{N_p}{N_s}}\left[K_2'(a') + Ge\eta\frac{N_p}{V}\right]\left[1 + \frac{P - P_1}{6P_1(a)}\right]^{3}. \qquad (3.17)$$

and that of the "hole" impurity band:

$$\widetilde{\Delta E}_6 = 8\sqrt{\frac{N_p}{N_s}}\left[K_1'(a') + Ge\eta'\frac{N_p}{V}\right]\left[1 + \frac{R - R_1}{6R_1(a)}\right]^{3}. \qquad (3.18)$$

In conclusion, the main reason for the formation of impurity bands is the migration of elementary dislocations (doublets and triplets, holes and singlets) from the principal sublattice to the impurity sublattice and conversely. The dependence of the width of the impurity band on concentration, follows a power law. Such a dependence makes it possible to understand the formation of impurity bands in the case of low concentrations. There are 4 references: 3 Soviet-

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D274/D303

bloc and 1 non-Soviet-bloc (in translation).

ASSOCIATION: L'vivs'kyy derzhavnyy universytet im. I. Franka (L'viv State University im. I. Franko)

SUBMITTED: August 8, 1960

Card 7/7

GLAUBERMAN, A.Ye.; KOBYLYANSKIY, V.B.; TAL'YANSKIY, I.I.

Distribution of neutrons in media with a cyclindrical interface and an off-axis source. Atom.energ. 10 no.5:513-515 My '61. (MIRA 14:5)

(Neutrons)

SHUMILOVSKIY, N.N., akademik, otv. red.; MIKHAYLOVSKIY, V.N., zam. otv. red.; GLAUBERMAN, A.Ye., doktor fiz.-mat. nauk, red.; SVENSON, A.N., kand. tekhn. nauk, red.; BEREZINSKIY, V.P., inzh., red.; SABANEYEV, K.D., nauchnyy red.; LIBERMAN, T.R., tekhn. red.

[Instruments for geophysical studies of wells by radioactive methods; transactions] Pribory dlia geofizicheskikh issledovanii skvazhin radioaktivnymi metodami; trudy. Kiev, Izd-vo Akad. nauk USSR, 1962. 190 p. (MIRA 15:9)

1. Vsesoyuznyy seminar po primeneniyu radioaktivnykh izotopov v izmeritel'noy tekhnike, L'vov, 1960. 2 Akademiya nauk Kirgizskoy SSR (for Shumilovskiy). 3. Chlen-korrespondent Akademii nauk Ukrainskoy SSR (for Mikhaylovskiy)
(Radioactive prospecting—Equipment and supplies)

GLAUBERMAN, Abba Yefimovich; FELLER, M.D., red.; SARANYUK, T.V., tekhn. red.

[Quantum mechanics]Kvanotova mekhanika. L'viv, Vyd-vo L'vivs'koho univ., 1962. 505 p. (MIRA 16:2)

(Quantum theory)

GLAUBERMAN A. YE.

[redacted]

Notes on lectures published [illegible]

I. Z. FISHER, Contemporary State and Achievements of the Theory of Liquids 13[illegible]

[illegible] Fluctuations of the Microstructure of Simple Liquids and Water 13[illegible]

A. [illegible] Statistical Theory of Liquid Solutions 14[illegible]

[illegible]. GLAUBERMAN, On the [illegible] Approximations in the New Form of "[illegible]" Decompositions 141

[illegible]KIY, Spectral-Method Investigation into the Structure of Non-Ideal Solutions 14[illegible]

[illegible] and [illegible], Investigation into Inter-molecular Interactions in Aliphatic Mercaptans and Their Solutions by means of Infrared Absorption Spectra 14[illegible]

YE. V. SHUVALOVA, On the Spectral Manifestation of the Hydrogen Bond in Some [illegible] 14[illegible]

STRUCTURE AND PHYSICAL PROPERTIES OF MATTER IN A LIQUID STATE reports read at the 4th Conference convened in KIYEV from 1 to 5 June 1959, published by the Publishing House of KIYEV University, KIYEV, USSR, 1962

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EWG(k)/EWT(1)/BDS/EEC(b)-2--AFFTC/ASD/ESD-3--Pz-4--AT/IJP(C)
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ACCESSION NR: AR3000381 S/0058/63/000/004/E071/E071

64

SOURCE: RZh. Fizika, Abs. 4E474

AUTHOR: Glauberman, A. Yu.; Ruvins'kiy, M. A.

TITLE: Internal photoeffect in the polar model for the case of a nondegenerate spin-closed system

CITED SOURCE: Visnyk L'vivs'k. un-tu. Ser. fiz., no. 1(8), 1962, 45-49

TOPIC TAGS: Internal photoeffect, polar model, effective-mass approximation

TRANSLATION: A theoretical investigation is made of the main features of the internal photoeffect by methods of nonstationary perturbation theory in the second-quantization representation and in the effective-mass approximation. The model of an atomic semiconductor is used, in which each atom has a shell consisting of two s-electrons. When light is absorbed there are generated in the crystal triplets and holes with oppositely-directed quasi-momenta, which act pairwise as carriers. The absorption of light has a resonant character with a resonant frequency that obeys the Einstein law for the photoeffect, formulated

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for elementary excitations of the crystal in the assumed model. The end-point frequency of the internal photoeffect is determined by the activation energy of the hole-triplet pair. Unlike in the single-electron theory, the law of energy conservation is formulated for the entire many-electron system as a whole. The elementary character of the light-absorption process is retained only for elementary excitations of the entire crystal, and not for the individual electrons. This result does not depend on the specific model and is a general law. The absorption spectrum is a band whose width is determined by the width of the band of current states. Yu. Ravich

DATE ACQ: 14May63 ENCL: 00 SUB CODE: PH

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Card 2/2

GLAUBERMAN, A. Ye.

[illegible]

24.2110

AUTHORS: Tyablikov, S.V. and Glauberman, A.Ye. [illegible]

TITLE: [illegible] the many-electron theory of [illegible]

PERIODICAL: [illegible] Ukrayins'kyy fizychnyy zhurnal, [illegible]
2[illegible] - [illegible]

TEXT: This study is related to an article by [illegible] and [illegible], in which the theory of [illegible] was developed by way of extending the [illegible] (Ref. 1: Ukr. fizych. zh., 5, 597, 1960). In Ref. 1 (Op. cit.) a [illegible] Hamiltonian of quasiparticles was considered, obtained by taking the statistical average of the Hamiltonian for an arbitrarily fixed configuration of atoms, over all possible configurations. The Hamiltonian of the system can be written in the form:

$$H = H_{backgr.} + H_{exc.} = H_{\xi} + H_{u} + H_{int.}$$

where the exact Hamiltonian $H_{backgr.} = H_{\xi}$ represents the [illegible]

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To the many-electron theory ... [illegible]

of the atoms of the liquid and the interaction between them [illegible], $H_{exc.} = H_e + H_{int.}$ represents the kinetic energy of the [illegible] energy of interaction of excitations with the [illegible], and the [illegible] -interaction energy. $H_{int.}$ is not simply the sum of terms, [illegible] depends only on the position of a single atom, but the sum of [illegible] terms, depending on the position of several atoms. The notation

$$H_0 = H_e + H_{[illegible]},$$

$$\overline{H}_{int.} = \frac{1}{Q} \underset{(\xi)}{Sp} \left\{ H_{int.} e^{-\beta H_0} \right\}, \qquad Q = \underset{(\xi)}{Sp} \left\{ e^{-\beta H_0} \right\}, \qquad \beta = \frac{1}{kT},$$

are introduced, where $\underset{(\xi)}{Sp}$ denotes taking the average over [illegible] variables. With the further notations

$$\overline{H}_0 = H_e + \overline{H}_{int.} + H_{[illegible]} = \overline{H}_e + H_{[illegible]},$$

$$V_1 = H_{int.} - \overline{H}_{int.}$$

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[illegible]

On the many-electron theory ...

[illegible] can express the exact hamiltonian for the natural [illegible] of [illegible] of the liquid, in the form:

$$H = \overline{H}_0 + h_{[illegible]} + V_1 = \overline{H}_0 + V_1 . \quad [illegible]$$

By neglecting the terms of order V_1^2 and higher order, one obtains:

$$Sp_{(S)} \{e^{-\beta H}\} = [illegible]\, e^{-\beta \overline{H}_e} . \quad [illegible]$$

In the same approximation, it is possible to replace H by the averaged hamiltonian $\overline{H}_e$, when calculating the mean values of quantities, whose operators act only on the excitation variables. Analogously, an approximate equation is derived for Green's function; this equation contains $\overline{H}e$ (instead of H). There are 5 Soviet-bloc references.

ASSOCIATION: L'vivs'kyy derzhuniversytet im. Iv. Franka (L'viv

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B???/B301

To the many-electron theory ...

State University im. Iv. Franko)

SUBMITTED: June 8, 1961

Card ?/4

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500010013-1"

[illegible]

24.2110

AUTHORS: [illegible], A. [illegible] and [illegible]

TITLE: On the theory of transport processes in liquid semiconductors

SOURCE: [illegible] fizicheskiy zhurnal, v. [illegible], [illegible]

TEXT: Transport processes in liquid semiconductors are considered on the basis of the theory, developed by the authors in a previous work (Ref. 1: [illegible], 1960); the results of the preceding article (in same issue, pp. [illegible] - [illegible]) are also used. The exact excitation-Hamiltonian for a fixed configuration of atoms is written in the form:

$$H = \overline{H} + (H - \overline{H}) \qquad (1)$$

the quantity $(H - \overline{H})$ is interpreted as a perturbation (the subscript of $H_{exc.}$ has been dropped, hence H denotes $H_{exc.}$). A liquid semicon-

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matter in crossed electric (E) and magnetic (H) fields is considered; the dependence of the conductivity on the magnetic field strength is determined. On the basis of the method of stationary states it is shown that the current, averaged over all the atomic configurations, is non-zero. A formula is derived, relating the operators of the quasiparticles ([illegible] and [illegible]) in $\bar{H}$, to those in H. The Hamiltonian $\bar{H}$ is diagonalized. The perturbation $\Delta H = H - \bar{H}$, which [illegible] form the current, is expressed in terms of the operators [illegible] and [illegible], which diagonalize $\bar{H}$. A formula is derived for the total number of quasiparticles which change their state as a result of the perturbation. After computations, one obtains an approximate formula for the resistance [illegible] in a weak magnetic field ([illegible]), viz.: $\rho_H = a(T) H^2$ ($a(T)$ is given by an expression). Thus the relationship between the resistance and the field strength in weak fields, is analogous to that in crystals, whereas the temperature dependence of the field strength is [illegible].

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500010013-1"

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D299/D301

On the theory of transport ...

completed. There are 8 references: 6 Soviet-bloc and 2 non-Soviet-bloc. The reference to the English-language publication reads as follows: [illegible], Ann.Phys., [illegible], 641, 1951.

ASSOCIATION: L'vivs'kyy derzhuniversytet im. Iv. Franka (L'viv State University im. Iv. Franko)

SUBMITTED: June 8, 1961

Card 3/3

ACCESSION NR: AP4012026 S/0185/64/009/001/0003/0013

AUTHOR: Glauberman, A. Ye.; Stasyuk, I. V.

TITLE: The method of nodal elementary excitations in the theory of semiconductors

SOURCE: Ukrayins'ky*y fizy*chny*y zhurnal, v. 9, no. 1, 1964, 3-13

TOPIC TAGS: semiconductor, Frenkel exciton, non-metallic crystal, nodal excitation, quasi particle

ABSTRACT: A general, precise theory of nodal elementary excitations for non-metallic crystals has been developed, in which the ground state of the system is consistently separated by the variational method. In the general case two branches of nodal excitations are established analytically. One of them describes charged quasiparticles which transmit current, and the corresponding various Frenkel excitons. The operators of this branch obey quasi-Pauli commutation relations. The method is illustrated on a simple spin-compensated background model, i. e., an atomic crystal in the ground state of which two electrons with oppositely directed spins are located at every node of the lattice.

Card 1/2

ACCESSION NR: AP4012026

Orig. art. has: 41 formulas.

ASSOCIATION: L'vivs'ky*y Derzhuniversy*tet im. Iv. Franka (L'vov State University)

SUBMITTED: 27Jun63 DATE ACQ: 14Feb64 ENCL: 00

SUB CODE: PH NO REF SOV: 012 OTHER: 001

Card 2/2

Card 1/2

L 45744-65

ACCESSION NR: AT5009624

2

presence of the ionic coupling only by considering the asymmetry of the electron cloud at the valent bonds. It is stated in conclusion that the calculation scheme can be greatly improved by using the

ASSOCIATION: None

SUBMITTED: 22Jun64 ENCL: 00 SUB CODE: SS

NR REF SOV: 009 OTHER: 002

Card 2/2

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500010013-1"

GLAUBERMAN, A.Ye.; POPEL', A.M. [Popel', O.M.]

Photoeffect with exciton involvement. Ukr. fiz. zhur. 10 no.8: 925-926 Ag '65. (MIRA 18:8)

1. L'vovskiy gosudarstvennyy universitet im. I.Franko.

Card 1/2

L 26059-65

ACCESSION NR: AP5004512

it possible to describe in a unified manner in terms of site excitations, excitations involving current carriers, spin excitations, Frenkel (tightly bound) excitons, Mott (weakly bound) excitons, etc. The topics mentioned and discussed in

ACC NR: AT6036980 (A,N) SOURCE CODE: UR/0181/66/008/011/3335/3338

AUTHOR: Glauberman, A. Ye.; Ruvinskiy, M. A.

ORG: L'vov State University im. I. Franko (L'vovskiy gosudarstvennyy universitet)

TITLE: Influence of excitons on the absorption of ultrasound in piezoelectric semiconductors

SOURCE: Fizika tverdogo tela, v. 8, no. 11, 1966, 3335-3338

TOPIC TAGS: ultrasound absorption, exciton, piezoelectric effect, elastic scattering, absorption coefficient, semiconductor crystal

ABSTRACT: The article is devoted to the absorption of sound resulting from interaction between excitons and longitudinal piezoelectric oscillations, under the assumption that the mean free path of the exciton is much larger than the length of the sound wave. The excitons are assumed to be nonlocalized, of the Wannier-Mott type. The piezoelectric interaction between the excitons and the sound may turn out to be so large that even when screened by free charges it leads in many cases to noticeable acoustic effects. The feasibility of separating the exciton absorption from the electronic absorption is first discussed. The absorption coefficient is determined with allowance for elastic scattering only, under the assumption of Maxwell-Boltzmann statistics. The result is then approximated for a cubic crystal such as CdS, and a value of 1.2 - 12 db/cm is obtained for the absorption coefficient. Estimates show that to produce a stationary exciton concentration of 10^{14} 10^{15} cm^{-3}

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500010013-1"

ACC NR: AP6036980

in CdS, the required illumination intensity is 0.57 - 5.7 w/cm^2, which is experimentally feasible. Other factors necessary for physical realization of exciton amplification of ultrasound are sufficient purity of the single crystals. Orig. art. has: 6 formulas.

SUB CODE: 20/ SUBM DATE: 20Apr66/ ORIG REF: 008/ OTH REF: 004

Card 2/2

GLAUBERMAN, A.Yu. [Hlauberman, A.IU.], prof., otv. red.; RYBALKA, V.V., red.; SEN'KIV, M.T., dots., red.; VISHNEVSKIY, V.N., [Vyshnevs'kyi, V.N.], dots., red.; YUKHNOVSKIY, I.R. [IUkhnovs'kyi, I.R.], dots., red.; PALYUKH, B.M., dots., red.; KVITKO, I.S., red.

[Problems in solid state physics] Pytannia fizyky tverdoho tila. L'viv, Vyd-vo L'vivs'koho univ., 1964. 117 p.
(MIRA 17:11)

1. Lvov. Universytet.

L 41745-66 EWT(1)/EWT(m)/T/EWP(t)/ETI IJP(c) JD/AT

ACC NR: AP6018040 SOURCE CODE: UR/0185/66/011/006/0673/0675

AUTHOR: Glauberman, A. Yu.; Ruvins'kyy, M. A.--Ruvinskiy,

72
B

ORG: L'vov State University im. I. Franko (L'vivs'kyy derzhuniversytet)

TITLE: Capture of free Wannier-Mott excitons in atomic crystals by shallow traps

SOURCE: Ukrayins'kyy fizychnyy zhurnal, v. 11, no. 6, 1966, 673-675

TOPIC TAGS: exciton, phonon, wave function, Schroedinger equation, capture cross section, energy band structure, crystal theory

ABSTRACT: The authors present the results of a quantum-mechanical analysis of the thermal capture of free excitons in atomic crystals by shallow traps whose energies lie at a distance smaller than the Debye end-point energy of the phonon below the bottom of the exciton band. The interaction between the exciton and the phonons is described with the aid of a Bardeen-Shockley potential. The probability of the process is calculated by using for the initial state a wave function obtained by solving the Schroedinger equation for the free exciton in the field of a singly-charged Coulomb center. The value obtained for the cross section of capture of the free Wannier-Mott excitons by this method is found to be the same as obtained by the methods of classical mechanics. Orig. art. has: 4 formulas.

SUB CODE: 20/ SUBM DATE: 11Jan66/ ORIG REF: 003/ OTH REF: 005

Card 1/1

GLAUBERMAN, Kh. B.

"Hoists and Cranes in Light Industries," Gizlegprom, Moscow, 1951

Deformation of the Crystalline Lattice of a Metal Near the Surface (In Russian.) S. Glauberman. *Zhurnal Eksperimental'noi i Teoreticheskoi Fiziki* (Journal of Experimental and Theoretical Physics), v. 19, Apr. 1949, p. 300-301.

Derives formula for relative displacements of ionic networks of the crystalline lattice of a metal having a face-centered structure in a direction perpendicular to the boundary surface on the basis of a simplified theory of the average density of the electron gas in each elementary nucleus of a metallic crystal. Also derives an expression for the additional potential developed in the metal in connection with the presence of a boundary surface.

GLAUBERMAN, S. B. Cand. Med. Sci.

"An Experiment in Treating Ozena and Atrophic Rhinitis with Colloid Solutions of Heavy Metals," Vest. Oto-rino-laringol., No.3, 1949.

Otorhinolaryngology Clinic
Chair of Pathological Physiology, Voronezh Med. Inst.

GLAUBERMAN, S.B.

Sub-periosteal administration of penicillin in acute otitis and mastoiditis due to scarlet fever. Vest. otorinolar., Moskva 14 no. 4:80-81 July-Aug. 1952. (CLML 22:5)

1. Candidate Medical Sciences. 2. Of the Clinic for Diseases of the Ear, Throat, and Nose (Director -- Prof. T. Ya. Abramov), Voronezh Medical Institute.

GLAUBERSON, S.A.; KAMINSKIY, P.G.

Correlation between tuberculosis and lupus erythematosus of the nose.
Vest. vener. No.3:42-43 May-June 50. (CLML 19:4)

GLAUBERZON, M.Ya.; PAVLYCHEV, I.M.

Pneumatic mail transportation in the Lvov telegraph and telephone exchange. Vest. sviazi 25 no.9:16-17 S '65. (MIRA 18:9)

1. Nachal'nik L'vovskoy telegrafno-telefonnoy stantsii (for Glauberzon).
2. Glavnyy inzh. L'vovskoy telegrafno-telefonnoy stantsii (for Pavlychev).

KNORRING, G.M., kandidat tekhnicheskikh nauk; GLAUBERZON, Ye.M., inzhener

Fluorescent lighting in sewing shops of a clothing factory. Sveto-tekhnika 1 no.5:17-20 O'55. (MLRA 8:12)
(Factories--Lighting) (Lighting, Fluorescent)

MINKIN, Anatoliy Samuilovich, kand. tekhn. nauk; GLAUBERZON, Yevgeniy Mironovich; ANDREYEV, A.I., red.; FREGER, D.P., red. izd-va; GVIRTS, V.L., tekhn. red.

[Repair and operation of certain kinds of machines and electric equipment at garment factories in Leningrad] Remont i ekspluatatsiia nekotorykh vidov tekhnologicheskogo i elektrotekhnicheskogo oborudovaniia na shveinykh fabrikakh Leningrada; obzor. Leningrad, 1961. 87 p. (MIRA 14:7)

(Leningrad—Clothing industry)

GLAUBERZON, Ye.M.; MALKINA, I.D.

Fluorescent lighting at the "Pervomayskaya" Factory in Leningrad.
Svetotekhnika 7 no.5:22-25 My '61. (MIRA 14:6)

1. Fabrika "Pervomayskaya" i LO Gosudarstvennogo proyektnogo instituta "Tyazhpromelektroproyekt".
(Leningrad--Fluorescent lighting)

GLAUER, G.A.

Penetration of solar ultraviolet rays through material used in making summer clothing for children. Trudy LSGMI 31:160-173 '56. (MIRA 12:8)

1. Kafedra shkol'noy gigiyeny Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta (zav.kafedroy - prof. A.Ya. Gutkin).

(CLOTHING
penetration of solar ultraviolet rays through material for clothing for child. (Rus))
(ULTRAVIOLET RAYS,
same)

GLAUER, G.A., assistent; LEBEDEVA, N.T., dotsent; [illegible], A.N., assistent; [illegible], N.N., assistent; RODINA, A.P., assistent; [illegible], N.N., assistent; FIGLIN, I.I., dotsent; KHRAMTSOVA, A.D., assistent

"Handbook for school physicians" by M.D. Bol'shakova and others. Reviewed by G.A. Glauer and others. Gig. i san. 25 no. 5:117-120 My '60. (MIRA 13:10)

(SCHOOL HYGIENE) (BOL'SHAKOVA, M.D.)

GUTKIN, A.Ya., prof.; GLAUER, G.A.; NIKOLAYEV, A.N.; PREOBRAZHENSKAYA, N.N.; RODINA, A.P.

Physical growth of school children in Kirovsk (Arctic region). Gig.i san. 25 no.8:23-27 Ag '60. (MIRA 13:11)

1. Iz kafedry gigiyeny detey i podrostkov Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta.
(COLD--PHYSIOLOGICAL EFFECT)
(KIROVSK--CHILDREN--GROWTH)

GLAUER, I.V.

Limit coefficient of baring. Ugol' 37 no.2:21-23 F '62.
(MIRA 15:2)

(Strip mining)

GLAUER, I. V., gornyy inzh.

Calculating the width of the mass of broken rock resulting from blasting benches in pits. Ugol' 38 no.4:26-28 Ap '63.
(MIRA 16:4)

(Blasting) (Strip mining)

GLA[illegible], [illegible]

Gla[illegible]man, [illegible] S. and Reznik, B. Y.- "The [illegible] by the photo-colorimetric [illegible] method," Nauch. za[illegible] (Dne[illegible] petr. [illegible] un-t), vol. XXXIII, 19[illegible], p. 13[illegible]-45

SO: U-5240, 17, Dec. 53, (Letopis 'Zhurnal 'nykh S[illegible], No. [illegible], 1949).

GLAUZE, G.F. (Prof.)

"Effect of Antiobiotics on Development of Viruses and Malignant Tumors,"

p. 103 Ministry of Health USSR Proceedings of the Second All-Union Conference on Antibiotics, 31 May - 9 June 1957. pp. 405, Moscow, Medgiz, 1957.

GLAVA, Cornel, Ing.; ROSENTHAL, Gabriel, ing.; RADU, Andrei

Considerations on the salt baths with indigenous substances for thermochemical and thermal treatments. Metalurgia constr mas 14 no. 3:207-212 Mr '62.

1. Institutul Tehnologic pentru Constructii de Masini si Electrotehnica.

[illegible]

APPROVED FOR RELEASE: 09/24/2001 CIA-RDP86-00513R000500010013-1"

GLAVAC, Stefan

The print shop of the Ljubljana Postal, Telegraph, and Telephone Office. PTT zbor 16 no.11:259-260 N '62.

GLAVACH, F. [Hlavac, F.]

At building projects in Czechoslovakia. Zhil. stroi. no.6:28-29 '62. (MIRA 15:7)

1. Direktor Nauchno-issledovatel'skogo instituta po stroitel'stvu v Prage.

(Czechoslovakia—Apartment houses)

BILEK, Vatslav, inzhener; BLATTNYY, TStibor, inzhener, doktor; BROZHEK, Karl, inzhener; DOGHAL, Lyudvig; GLAVACHEK, Frantishek; LGOTSKIY, Alois, inzhener, doktor; MAKHAT, Frantishek; KAGAL, Yaroslav; OSVAL'D, Vladimir, inzhener; RUZHICHKA, Moymir, inzhner; SALACH, Vatslav, inzhener, doktor; TRKAN, Miroslav, inzhener; ZHILA, Vladimir; SHKOP, Ya., inzhener [translator]; MEDINTSEV, M., inzhener, [translator]; MASLOVA, Ye.F., redaktor; GOTLIB, E.M., tekhnicheskiy redaktor.

[Techology of malt and beer] Tekhologiia soloda i piva. Avtorskii kollektiv Vatslav Bilek i dr. Avtoriz. perevod s cheshskogo IA. Shkopa i M. Medintseva, Moskva, Pishchepromizdat. Vol. 1. [Malt production] Proizvodstvo soloda. Translated from the Czech. 1957. 285 p. (MIRA 10:6)

(Malt)

GLAVACHEK, Ivan [Hlavacek, Ivan], Inz. CSc.

Asymmetric buckling of an initially deformed [illegible] spherical shell under external pressure. Aplikace mat 8 no.6:399-410 '63.

1. Matematicky ustav, Ceskoslovenska akademie ved, Praha 1, Zitna 25.

GLAVACHEK, V. [Hlavacek, V.] (Praga); YIRZHICHNY, Y. [Jiricny, J.] (Praga)

Hormone therapy of allergic rhinitis. Zhur.ush., nos.i gorl.bol. 21 no.6:10-14 N-D '61. (MIRA 15:11)
(HORMONE THERAPY) (ALLERGY) (NOSE--DISEASES)

L 34700-65 EPF(n)-2/EWP(j)/EWT(1)/EWT(m) Pc-4/Pu-4 RM/WW

ACCESSION NR: AP4045165 Z/0009/64/000/009/0478/0480 21 20 B

AUTHOR: Hlavacek, Vladimir (Glavachek, Vladimir); Stepanek, Josef (Shtepanek, Yosef)

TITLE: Heat transmission during drop condensation on silicone varnish 21

SOURCE: Chemicky prumysl, no. 9, 1964, 478-480

TOPIC TAGS: heat transmission, silicone varnish, heat transfer coefficient, heat flow coefficient, thermal characteristic, drop condensation

ABSTRACT: Experiments made to determine the possibility of using silicone varnishes on condensers have shown that drop condensation on silicone varnish takes

209 [1937]; Emmons, H.W.: Trans. Am. Soc. Chem. Engrs. ...

Card 1/3

L 34700-65

ACCESSION NR: AP4045165

present investigation the coefficients of heat flow were determined on a laboratory installation one quarter full operating size, and it was shown visually, as ... the heat transfer coefficients on the condensing

Card 2/3

L 34700-65

ACCESSION NR: AP4045165

silicone varnishes on the heat flow coefficient is even more marked. Orig. art. has: 6 diagrams and 11 formulas.

ASSOCIATION: Katedra procesu a aparatu VSCHT, Prague (Department of Processes and Apparatus, VSCHT)

SUBMITTED: 10Dec63 ENCL: 00 SUB CODE: MT, TD

NO REF SOV: 000 OTHER: 014

GLAVACHKOVA, Ye. V.

"Nitrogen-Fixing Activity of Nodular Bacteria of Lucerne Tubers Depending on the Phase of the Development of the Plant and Its Age." Cand Biol Sci, Moscow Agricultural Acad imeni K. A. Timiryazev, Moscow, 1954. (RZhBiol, No. 8, Dec 54)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (11)
SO: Sum. No. 556, 24 Jun 55

GLAVACHKOVA, YE. V.

Nitrogen-fixing activity by nodule bacteria of alfalfa. M. V. Fedorov and E. V. Glavachkova. *Izvest. Timiryazev. Sel'skokhoz. Akad.* 1950, No. 1, 61-78.—Fixation of N is highest in nodules of the 1st-year growth, lower in the 2nd-year growth, and still less in 3rd-year growth. To increase the N fixation in newly established alfalfa, the inoculation should be made with nodules of 1st-year growth. The high N fixation from 1st-year growth persists over the years of the alfalfa stand. Nodules grown in soils ...